FINAL SAMPLING AND ANALYSIS PLAN AND QUALITY ASSURANCE PROJECT PLAN (SHORT FORM)

L&R OIL RECOVERY ASSESSMENT SITE SHELBY, CLEVELAND COUNTY, NORTH CAROLINA

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Region 4
Atlanta, GA 30303

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Date Prepared	:	March 11, 2019
EPA Task Monitor	:	Kevin Eichinger
Telephone No.	:	(404) 562-8268
Prepared by	:	Tetra Tech, Inc.
START IV Project Manager	:	Paul Prys
Telephone No.	:	(678) 775-3106

Prepared by	Reviewed by	Approved by
Paul Prys START IV Project Manager	Leslie Shaver START IV Technical Reviewer	Andrew F. Johnson START IV Program Manager

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SAMPLING AND ANALYSIS PLAN & QUALITY ASSURANCE PROJECT PLAN (SHORT FORM)

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 4 & TETRA TECH, INC.

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM CONTRACT NO. EP-S4-14-03

Site Name:	L&R Oil Recovery Assessment Site	**City, County:** Shelby, Cleveland County	**State:** North Carolina
Prepared By:	Tetra Tech, Inc. (Tetra Tech)	**Date:** March 11, 2019	
Approved By:	Paul Prys **Date:** 03/11/2019	**Signature:**	
Title:	Tetra Tech Superfund Technical Assessment and Response Team (START) IV Project Manager (PM)		
Approved By:	Jessica Vickers **Date:** 03/11/2019	**Signature:**	
Title:	Tetra Tech START IV Quality Assurance (QA) Manager		
Approved By:	Andrew F. Johnson **Date:** 03/11/2019	**Signature:**	
Title:	Tetra Tech START IV Program Manager		
Approved By:	Kevin Eichinger **Date:** 3/18/2019	**Signature:**	
Title:	U.S. Environmental Protection Agency (EPA) Task Monitor Designated Approving Official		

1.0 PROJECT INFORMATION

1.1 Distribution List

EPA Region 4:

Kevin Eichinger, Task Monitor
Katrina Jones, Project Officer

Tetra Tech:

Angel Reed, START IV Document Control Coordinator

1.2 Project/Task Organization

Kevin Eichinger will serve as the EPA Task Monitor (TM) for the removal assessment activities described in this sampling and analysis plan (SAP) and quality assurance project plan (QAPP). Paul Prys of Tetra Tech will serve as the site manager and is responsible for maintaining an approved version of this QAPP. Jessica Vickers of Tetra Tech will provide laboratory coordination and serve as the quality assurance (QA) manager and is responsible for providing Tetra Tech approval of this QAPP, coordination of data validation, final sign-off on data, and final approval of data quality. The EPA TM has authority to issue a Stop Work Order. Specific Tetra Tech field personnel will be selected before mobilization as defined under the Superfund Technical Assessment and Response Team (START) IV Contract No. EP-S4-14-03 and will be organized in accordance with the organizational chart on Figure 1-1 of Section 1.1 in the Tetra Tech START Program Level QAPP.

1.3 Problem Definition/Background

The L&R Oil Recovery Assessment site (the site) is located at 501 Ruth Street in Shelby, Cleveland County, North Carolina (see Figure 1 in Appendix A). The geographic coordinates of the LROR site are 35.299578 degrees north latitude and 81.528714 degrees west longitude. The site is a 1.14-acre tract of land consisting of a 6,500 square foot, single-story building and a two-bay covered loading rack (see Figure 2 in Appendix A). The main building is in poor condition with a deteriorated roof and a section of the concrete floor missing. The property is bordered to the north by a commercial property with Buffalo Street beyond; to the east by Lineberger Street and a commercial property, with residential properties beyond; to the south by a Ruth Street with a commercial property and residential properties beyond; and, to the west by residential properties with Douglas Street beyond (see Figure 2 in Appendix A).

The site originally operated as an oil transloading facility and currently operates as a used oil and used oil filter recovery center. The used oil is stored onsite in a 6,500 gallon tanker and in a 9,000 tanker, which are used as temporary Above Ground Storage Tanks (AST), and then transported to a used oil recycling facility. The oil filters are drained into containers inside the building and then stored for disposal in a covered roll-off dumpster. Various totes and 55-gallon drums are stored inside and outside of the building. There are seven 20,000-gallon underground storage tanks (UST) on the northern end of the property. According to the Potentially Responsible Party (PRP), two of the USTs contain an unknown amount of diesel fuel and water. There is one oil recovery truck stored in the loading rack. The site is fenced; however, there is evidence of trespassing and vandalism.

On September 14, 2018, the North Carolina Department of Environmental Quality (NCDEQ), the City of Shelby, and Cleveland County officials responded to an emergency request involving the release of approximately 3,000 gallons of used oil from a storage tanker at the site. Due to an act of vandalism, the contents of the 6,500-gallon storage tanker was discharged into the building via a connected hose placed through a window in the northwestern portion of the building. The used oil filled then exited the building through the eastern rollup door impacting parking and vegetated areas, the southern office door impacting Ruth Street and a storm drain, and the western foundation affecting a ditch along the eastern side of the building. Local emergency officials initially responded to the discharge and deployed emergency defensive measures to prevent migration beyond Ruth Street. The site experienced rains from Hurricane Florence which caused the discharged oil to enter a nearby storm drain and several sections of the sanitary sewer system. The City of Shelby contracted Clean Harbors, Inc. to decontaminate the nearby storm drain prior to hurricane landfall and waste from decontamination activities was stored in 250-gallon totes on site for disposal.

NCDEQ notified Region 4 U.S. Environmental Protection Agency (EPA) of the spill. The EPA, contracted with a local response contractor, HEPACO, who mobilized the same day to conduct the initial site stabilization. EPA coordinated initial stabilization efforts from the Regional Emergency Operations Center (REOC) while Hurricane Florence made landfall. EPA and the Tetra Tech Superfund Technical Assessment and Response Team (START) mobilized to the site on September 17, 2018.

From September 18 through 20, 2018, EPA and the Tetra Tech START conducted emergency response activities consisting of waste container inventory, hazard categorization, and waste sampling for disposal purposes. Laboratory analytical results indicated elevated polychlorinated biphenyl (PCB) and semivolatile organic compound (SVOC) levels in the oil stored in the tanker located at the northern end of the site and elevated volatile organic compound (VOC) and SVOC levels in the waste drums and totes.

On November 19 and 20, 2018, EPA and Tetra Tech START collected waste samples from the USTs located at the site, additional waste samples from the soil, totes, and drums at the site, and sediment samples from Hickory Creek and

site outfall. Laboratory analytical results indicated elevated PCB levels in the waste oil totes and elevated VOC and SVOC levels in the USTs, soil, totes, and drums.

On February 20 and 21, EPA and a Tetra Tech START North Carolina-accredited asbestos inspector visually inspected and collected bulk material samples of suspect ACM from the site building to identify the presence and quantities of ACM for removal prior to demolition activities.

The purpose of this removal assessment is to generate data to determine the presence or absence of contamination at the site and at nearby residential properties.

1.4 Project/Task Description

Tetra Tech was tasked with conducting the following activities during the site assessment (see Figure 2 in Appendix A and Table B-1 in Appendix B):

- Assess and sample the soil on site for VOC, polynuclear aromatic hydrocarbons (PAHs), PCBs, and Resource Conservation and Recovery Act (RCRA) metals contamination.
- Assess and sample the nearby residential properties for PCB contamination.
- Visually inspect the site building and collect samples of suspect asbestos-containing materials (ACM) to determine the presence or absence of asbestos.
- Conduct air sample collection to demonstrate effectiveness of engineering controls preventing offsite fiber migration during ACM removal and site demolition activities.
- Prepare draft and final reports detailing the findings of site activities.

Soil Samples

Five composite soil samples and three grab soil samples will be collected from eight locations at the site based on functional space as determined by the TM. 24 composite samples will be collected from 12 residential properties (see Figure 2 in Appendix A). The contamination levels at these locations will determine whether a removal action is warranted at the site or at nearby residential properties.

The following locations have been identified for composite soil sample collection:

- The tote area located in the northwestern portion of the site.
- The UST area located along the northern, central portion of the site.
- The waste soil and tote staging areas located in the northeastern portion of the site.
- The impacted vegetative area located in the southern, central portion of the site.
- The ditch located along the western side of the site building.

The following locations have been identified for grab soil sample collection:

- The tote area located in the northwestern portion of the building.
- The drum storage area located in the central portion of the eastern side of the building.
- The parking area located in the central portion of the site.

The following residential properties have been identified for composite soil sampling:

- 600 Ruth Street
- 604 Ruth Street
- 606 Ruth Street
- 618 Douglas Street
- 700 Douglas Street
- 702 Douglas Street
- 704 Douglas Street
- 706 Douglas Street
- 708 Douglas Street
- 710 Douglas Street
- 712 Douglas Street
- 716 Douglas Street

A hand-held coring device will be used to collect grab and composite soil samples from the site and the nearby residential properties. A concrete coring machine will be used to cut holes into the building foundation and parking area to access the soil underneath. Each composite sample will contain a minimum of five aliquots collected in an array to be determined in the field. Samples for each location will be collected from a depth of 0-12 inches below ground surface (bgs). The samples will be submitted to a Tetra Tech-procured laboratory for analysis.

Each aliquot, collected with a hand-held coring device, will be of uniform volume. Each grab sample or all aliquots from each composite sample will be placed into a single-use aluminum pan and thoroughly mixed and homogenized using a stainless-steel spoon. The entire homogenized sample will then be placed into laboratory recommended containers, while avoiding placement of rock and vegetation into the sample containers as much as practical. Soil samples collected for VOC analysis from composite sample locations will be grab samples collected separately from the 5-point composite soil samples. After packing the samples in a custody-sealed cooler on ice, they will be shipped to the laboratory for analysis of VOCs, PAHs, PCBs, and RCRA metals.

In addition to the grab and composite samples, one field duplicate soil sample and one other sample will have MS/MSD triplicate volume collected for every 20 soil samples collected. Each sample will be collected in the same manner and analyzed for the same analytes as described above. Additional targeted soil samples may be requested by the EPA TM during the sample event, to include different locations, types (grab or composite), and depths of samples to be collected, and the analyses performed.

Regional Removal Management Levels (RMLs) are risk-based concentrations that are used to support decisions regarding undertaking removal actions under the Comprehensive Environmental Response, Compensation, and Liability Act. Attachment 1 provides RMLs for the contaminants of concern at the site. Analytical results for soil samples collected at the site and nearby residential properties will be compared to the RMLs for residential soil. These comparisons will provide guidance when determining removal actions.

Suspect ACM Samples

Approximately 60 suspect ACM samples will be collected from homogenous areas from the exterior and interior of the site building by a North Carolina-accredited asbestos inspector. Suspect ACM samples will be collected in accordance with the guidelines identified in 40 Code of Federal Regulation (CFR) Part 763, Asbestos, Subpart E, Asbestos-Containing Materials in Schools, 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAP), Subpart M, National Emission Standards for Asbestos, EPA Region 4 SESD FBQSTP for *Bulk Sampling for Asbestos* (SESDGUID-104-R1), June 2013, and the North Carolina Administrative Code (NCAC), Chapter 10-A, Subchapter 41C – Occupational Health, Section .0600, Asbestos Hazard Management Program (10A NCAC 41C .0600), June 2003.

Air Samples

Approximately 8 to 12 air samples will be collected prior to and during asbestos removal and site building demolition activities by a North Carolina-accredited air monitor or supervising air monitor in accordance with 10A NCAC 41C .0600. EPA and Tetra Tech will select four stationary perimeter air sampling locations before removal of ACM and site building demolition activities. Results will be used to demonstrate the effectiveness of engineering controls preventing airborne fibers migrating offsite during removal and demolition activities, as well as to guide safety controls. EPA has established the site action level to be 0.001 fibers per cubic centimeter (f/cc) air asbestos action level for baseline residential exposure in accordance with OSWER Directive #9200.0-68, *Framework for Investigating Asbestos-Contaminated Superfund Sites*.

Air samples will be collected using high-volume air sampling pumps fitted with 25-millimeter (mm) diameter, 0.8 micrometer (µm) pore size mixed cellulose ester (MCE) filter cassettes analyzed by phase contrast microscopy (PCM). Perimeter air samples will be collected approximately 4 to 5 feet above the ground surface to represent exposures in the breathing zone during removal activities. Filter cassettes will be placed in a downward approximately 45-degree angle position with the inlet caps of the filter cassettes removed (open-faced) during sampling. Perimeter air samples will be collected at a flow rate of approximately 10 liters per minute (L/min) or at a flow rate resulting in collection of at least 3,850 liters of air during a 10-hour work shift. The flow rate of the fully assembled air sampling trains will be calibrated and recorded before samples are collected using a rotameter. Once the sampling pump has been adjusted to the desired flow rate, the initial flow rate recorded will be the average of 10 continuous flow readings as registered by the rotameter. The post-sampling period flow rate (also measured using the rotameter) will be measured while the air sampling train is still collecting air at its sampling location, just before the sampling period ends. It is important to use

the filter cassette for collecting the actual sample while the flow rate is measured before and after samples are collected; this procedure is especially important for the after-sample collection flow rate measurement because loading of dust and other materials during sampling may have altered the flow rate throughout the collection period. Without adjusting the flow rate of the sampling pump, the post-sampling flow rate will be recorded as the average of 10 continuous flow readings as registered on the rotameter.

Perimeter air samples will be analyzed in accordance with the guidelines established in 29 CFR 1926.1101, Appendix A and Appendix B by a Tetra Tech-procured, American Industrial Hygiene Association- (AIHA) accredited laboratory using National Institute of Occupational Safety and Health (NIOSH) Method 7400, *Asbestos and Other Fibers*. Air sample laboratory analytical results exceeding the site established action level of 0.001 f/cc for residential areas, will be analyzed for airborne asbestos fiber by transmission electron microscopy (TEM) via NIOSH Method 7402, *Asbestos by TEM*, to be reported as a PCM-equivalent. Perimeter air samples that yield PCM results greater than the site established action level of 0.001 f/cc for residential areas will result in the suspension of removal activities until additional engineering controls are implemented to reduce asbestos fibers from migrating offsite.

1.5 Quality Objectives and Criteria for Measurement Data

Identification of the seven steps of the data quality objectives (DQO) process: To support the objectives of the sampling event, DQOs were established for the site to specify quantity and quality of data to be acquired. DQOs were developed by application of the seven-step process outlined in the following guidance documents: "EPA Requirements for Quality Assurance Project Plans," EPA QA/R-5, March 2001; "Guidance for Quality Assurance Project Plans," EPA QA/G-5, December 2002; and "Guidance on Systematic Planning Using the Data Quality Objectives Process," EPA QA/G-4, February 2006.

Step 1: State the Problem	**Stakeholders:** EPA, NCDEQ, City of Shelby, property owners, and community. **Site History/Conceptual Site Model:** The site, located at 501 Ruth Street in Shelby, Cleveland County, North Carolina, includes an approximately 1.14-acre tract of land. The nearby residences located along Ruth Street and Douglas Street vary in size. For additional information, see Sections 1.3 and 1.4 of this SAP/QAPP. **Statement of Problem:** Determine the presence and nature of contamination at each property.
Step 2: Identify the Goals of the Study	**Study Questions:** Is soil contamination present at the site and the nearby residential properties? Are contaminants present on each property at concentrations that exceed comparison criteria? **Decision Statements:** Analytical results from environmental samples collected at the site and nearby residential properties will determine if contamination is present. The analytical data will be evaluated as whether contaminant concentrations exceed comparison criteria listed in Step 5 of this SAP/QAPP.
Step 3: Identify Information Inputs	**Inputs:** The site history is described in Section 1.3 of this SAP/QAPP.
Step 4: Define Study Boundaries	**Spatial Boundary:** The site includes an approximately 1.14-acre tract of land currently used as a used oil and used oil filter recovery center. The site consists of a 6,500 square foot single-story building and a two-bay covered loading rack, two tankers, used as ASTs, for the storage and transport of used oil, and seven 20,000-gallon USTs. The property is bordered to the north by a commercial property with Buffalo Street beyond; to the east by Lineberger Street and a commercial property, with residential properties beyond; to the south by a Ruth Street with a commercial property and residential properties beyond; and, to the west by residential properties with Douglas Street beyond (see Figure 2 in Appendix A). **Temporal Boundaries:** The removal assessment sampling event is scheduled for the week of March 11, 2019.

Step 5: Develop the Analytical Approach	**Analytical Methods:** Laboratory analyses of samples will include: • VOCs by application of EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) Method 8260B for soil samples. • PAHs by application of EPA SW-846 Method 8270D for soil samples. • PCBs by application of EPA SW-846 Method 8082A for soil samples. • RCRA metals (including mercury) by application of SW-846 Methods 6010D and 6020B for soil samples. • Suspect ACM samples by application of EPA/600/R-93/116 for bulk building material samples. • PCM samples by application of NIOSH Method 7400 for area air samples. • TEM samples by application of NIOSH Method 7402 for area air samples exceeding site action levels. All analyses will be performed by subcontracted laboratories procured by Tetra Tech. **Comparison Criteria:** Analytical results will be compared with the comparison criteria listed as follows: • Soil: EPA Regional Removal Management Levels (RML), November 2018: https://www.epa.gov/risk/regional-removal-management-levels-chemicals-rmls. **Decision Rules:** Analytical results will be compared to the criteria listed above (see Attachments 1, 2, and 3). EPA and NCDEQ will make all decisions regarding results.
Step 6: Specify Performance or Acceptance Criteria	Initial acceptance of analytical results will be determined via data validation by Tetra Tech that will evaluate usability of the data. Level IV data packages for soil will be requested from the Tetra Tech-procured laboratory. Tetra Tech will perform a Stage 2A validation of the data packages. Any qualified or rejected data and reasons for qualification or rejection will be summarized in the data validation report. During the data validation process, Tetra Tech will ensure that results meet requirements of the analytical methods and the START Program Level QAPP. Specific information on criteria for acceptance of analytical results, including quality control (QC) samples, should be included in the Laboratory Quality Assurance Manual. A copy of the Laboratory Quality Assurance Manual will be requested upon award of the subcontract.
Step 7: Develop the Plan for Obtaining Data	**Optimized Design:** The sampling design consists of eight soil samples to be collected on site and 24 soil samples to be collected from 12 residential properties near the site (see Figure 2 in Appendix A). An estimated total of 34 soil samples (3 grab soil samples from onsite, 29 composite soil samples from onsite and nearby residential properties, and two field duplicates samples) are proposed for this event. Five aliquots will be collected for each composite sample (see details in Section 1.4). ACM samples… The appropriate QA/QC samples will be collected. Sample nomenclature, locations, and rationales are described in Table B-1 of Appendix B. Table B-2 of Appendix B presents the type of and collection frequencies of various QA/QC samples. Refer to Section 1.4 for the sampling approach and objectives.

1.6 Special Training/Certification Requirements

☒	OSHA 29 CFR 1910.120	☒	Special Equipment/Instrument Operator (describe below):	☐	Other:

Special Requirements: Geoplatform: Only field team members trained on proper use of the Geoplatform System will operate this instrument.

1.7 Documentation and Records

The most current version of this SAP/QAPP will be distributed to the entire distribution list presented in Section 1.1. The Tetra Tech site manager will be responsible for maintaining the most current revision of this SAP/QAPP and for distributing it to all personnel and parties involved in the field effort. Field records that may be generated to include the following:

☒	Chains-of-Custody Forms	☒	Health and Safety Plan (HASP)
☐	Field Instrument Calibration Logs	☒	Photographic log
☐	Field Monitoring and Screening Results	☒	Site Logbook/field sheets
☒	Tailgate Sign-In Sheet	☒	Site Maps and Drawings
☐	Soil Boring Logs	☐	Well Construction Logs

Field documentation and records will be generated and maintained in accordance with requirements specified in the EPA Region 4, SESD FBQSTP guidance document for *Logbooks* (SESDPROC-010-R5), May 2013. This document is accessible at the following web address: http://www.epa.gov/quality/quality-system-and-technical-procedures-sesd-field-branches. All field-generated data also will be maintained in the project file and included, as appropriate, in project deliverables in final form after all reviews and applicable corrective actions.

The formal deliverables for EPA associated with this project are specified in the EPA technical direction document (TDD). Draft and final reports will be prepared to summarize field activities and findings, and to present validated laboratory analytical results. All project records, including electronic and hard copies of field, laboratory, and project deliverables under Tetra Tech's control will be maintained and retained in accordance with the requirements of EPA START IV Contract No. EP-S4-14-03, and Section 5.0, page 16 of the Tetra Tech START Quality Management Plan, November 2015.

2.0 DATA GENERATION AND ACQUISITION

2.1 Sampling Process Design

Tables B-1 through B-4 of Appendix B present details on the types and numbers of samples collected, sampling locations and rationale, sample containers, analytical parameters, sample matrices, laboratory analytical methods, performance or acceptance criteria, preservation methods, and sample holding times. The rationale for this sampling design is based on the task description in Section 1.4 of this SAP/QAPP and the DQO process discussed in Section 1.5. Soil and QC samples will be submitted to the subcontract laboratory procured by Tetra Tech and analyzed for VOCs, PAHs, PCBs, and RCRA metals. Asbestos bulk and air samples will be submitted to the subcontract laboratory procured by Tetra Tech and analyzed for asbestos concentrations in the bulk materials and airborne fiber and airborne asbestos fiber concentrations in the air samples.

2.2 Sample Methods Requirements

Matrix	Sampling Method	EPA and Tetra Tech Standard Operating Procedures and Guidance
Soil	Refer to Tables B-1 through B-4 for more details, including requested analytical parameters and methods.	Refer to the EPA SW-846 Methods 8260D, 8270D, and 8082A; the EPA Region 4 SESD FBQSTP for *Soil Sampling* (SESDPROC-300-R3), August 2014. Also refer to Section 2.2, page 19 of the Tetra Tech START Program Level QAPP, March 2016. A list of applicable Safe Work Practices is included in the HASP, which will be available on site.
Suspect ACM		Refer to EPA 600-R-93-116 and the EPA Region 4, SESD FBQSTP for *Bulk Sampling for Asbestos* (SESDGUID-104-R1), June 2013. Also refer to Section 2.2, page 19 of the Tetra Tech START Program Level QAPP, March 2016. A list of applicable Safe Work Practices is included in the HASP, which will be available on site.
Air		Refer to the following: EPA. 2011 through 2015. Region 4, SESD SOPs, found in *Field Branches Quality System and Technical Procedures*: *Global Positioning System (SESDPROC-110-R4)*, June 2015 *Ambient Air Sampling (SESDPROC-303-R5)*, March 2016 *Field Sampling Quality Control (SESDPROC-011-R5)*, April 2017 *Packing, Marking, Labeling and Shipping of Environmental and Waste Samples (SESDPROC-209-R3)*, February 2015 These documents can be found at the following web address: https://www.epa.gov/quality/quality-system-and-technical-procedures-sesd-field-branches. EPA. 2008. Office of Solid Waste and Emergency Response (OSWER) Directive #9200.0-68, Framework for Investigating Asbestos-Contaminated Superfund Sites. NIOSH. 1994. Asbestos and Other Fibers by PCM, Method 7400. NIOSH. 1994. Asbestos by TEM, Method 7402. Also refer to Section 2.2, page 19 of the Tetra Tech START Program Level QAPP, March 2016. A list of applicable Safe Work Practices is included in the HASP.

Other Sample Method Requirements: The Tetra Tech TDD manager, in coordination with the EPA TM, is responsible for identifying failures in sampling and field measurement systems, overseeing any corrective actions, ensuring that the corrective actions are documented in site logbooks and other appropriate records, and assessing the effectiveness of corrective actions. Global positioning system (GPS) data collected in the field will be conducted in accordance with the EPA Region 4 SESD FBQSTP *Global Positioning System* (SESDPROC-110-R4), June 2015. Field decontamination will be conducted in accordance with the procedures provided in the EPA Region 4, SESD FBQSTP *Field Equipment Cleaning and Decontamination* (SESDPROC-205-R3), December 2015, available at the following web address: https://www.epa.gov/quality/quality-system-and-technical-procedures-sesd-field-branches. Equipment required for this sampling event includes sample containers; sample preservatives; sample packaging materials such as coolers and suitable packing material; stainless steel spoons, incremental sampling tools, and disposable aluminum pans; a GPS receiver; and personal protective equipment (PPE) identified in the HASP (including disposable nitrile gloves and boot covers). Also see Table B-5 in Appendix B for a more complete list of field equipment and supplies.

2.3 Sample Handling and Custody Requirements

Sample handling and chain-of-custody record keeping will be conducted in accordance with the EPA Region 4, SESD FBQSTP for *Packing, Marking, Labeling and Shipping of Environmental and Waste Samples* (SESDPROC-209-R3), February 2015; and *Sample and Evidence Management* (SESDPROC-005-R2), January 2013. Both documents are available at the following web address: https://www.epa.gov/quality/quality-system-and-technical-procedures-sesd-field-branches. Once collected, soil samples will be placed on ice and asbestos bulk and air samples will be placed in resealable plastic bags and kept in separate custody-sealed coolers in a secure location. The Tetra Tech site manager will ensure that custody of samples is maintained until they are delivered to the laboratory. Chain-of-custody records will be used to document samples collected and delivered to the laboratory. Also refer to Section 2.3, page 30 of the Tetra Tech START Program Level QAPP, March 2016.

2.4 Analytical Method Requirements

Analytical parameters and associated laboratory analytical methods applied for this project are listed in Appendix B, Table B-3.

A turnaround time of 10 business days for final results will be requested of the Tetra Tech-procured subcontracted laboratory. Initial acceptance of analytical results will be determined via data validation that Tetra Tech performs to evaluate usability of the data. The data validation report will discuss whether the QC limits (acceptance criteria) for the results, including QC samples, will have been met.

Level IV data packages for soil samples will be requested from the laboratory procured by Tetra Tech. Any qualified or rejected data and reasons for qualification/rejection will be summarized in the data validation report.

Refer to Section 2.4, page 33 of the Tetra Tech START Program Level QAPP, March 2016.

2.5 Quality Control Requirements

The field-measurement data to be acquired during this investigation will be GPS data by use of a tablet fitted with a global navigation satellite system (GNSS). QC requirements for GPS data collection are provided in the manufacturer's instruction manual and the EPA Region 4, SESD FBQSTP for *Global Positioning System* (SESDPROC-110-R4), June 2015.

QC requirements for field sampling are provided in the EPA Region 4, SESD FBQSTP for *Soil Sampling* (SESDPROC-300-R3), August 2014 and the EPA Region 4, SESD FBQSTP *Field Sampling Quality Control* (SESDPROC-011-R5), April 2017, *Bulk Sampling for Asbestos* (SESDGUID-104-R1), June 2013, and *Ambient Air Sampling (SESDPROC-303-R5)*, March 2016. All are available at the following web address: http://www.epa.gov/quality/quality-system-and-technical-procedures-sesd-field-branches.

QC requirements for analytical methods are presented in the EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Third Edition, Final Updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), and V (2015) (accessible at: https://www.epa.gov/hw-sw846); and in Section 2.5.2, page 37 of the Tetra Tech START Program Level QAPP, March 2016.

Laboratory QC samples will include matrix spike and matrix spike duplicate (MS/MSD) sample sets collected at a frequency of 1 MS/MSD set for every 20 samples per matrix. Field QC samples will include field duplicate samples collected at a frequency of one field duplicate sample for every 20 samples per matrix, one aqueous trip blank per shipment of samples collected for VOC analysis, one aqueous field blank, and at least one equipment rinsate blank per type of sampling equipment used.

Water used for preparation of trip blanks, field blanks, and equipment rinsate blanks will be certified ASTM Type 2+ Ultra-Pure blank water. Field and laboratory QC samples are listed in Tables B-1 and B-2 in Appendix B. All QC samples will be submitted for analyses for parameters listed in Appendix B, Table B-3 of this SAP/QAPP.

2.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements

For instrument testing, inspection, and maintenance requirements for field monitoring, refer to the EPA Region 4, SESD FBQSTP for *Equipment Inventory and Management* (SESDPROC-108-R5), August 2015; *Global Positioning System* (SESDPROC-110-R4), June 2015; and *Field Equipment Cleaning and Decontamination* (SESDPROC-205-R3), December 2015. These documents are available at the following web address: https://www.epa.gov/quality/quality-system-and-technical-procedures-sesd-field-branches. Also refer to the manufacturer's operating manuals for further instructions on field instrument testing, inspection, and maintenance, as well as to Section 2.6.2, page 42 of the Tetra Tech START Program Level QAPP, March 2016. Table B-5 in Appendix B lists field equipment to be used during this sampling event. The Tetra Tech site manager or designee will be responsible for ensuring correct operation of all field equipment.

Laboratory instrument testing, inspection, and maintenance requirements are specified in SW-846 methods; the instrument and equipment manufacturer's operating manuals associated with the analytical methods; the laboratory Quality Assurance Manual (QAM); and Section 2.6.3, page 42 of the Tetra Tech START Program Level QAPP, March 2016.

2.7 Instrument Calibration and Frequency

For instrument calibration and frequency requirements for field monitoring, refer to the EPA Region 4, SESD FBQSTP for *Equipment Inventory and Management* (SESDPROC-108-R5), August 2015; and *Global Positioning System* (SESDPROC-110-R4), June 2015. These documents are available at the following web address: http://www.epa.gov/quality/quality-system-and-technical-procedures-sesd-field-branches. Also refer to the equipment manufacturers' operating manuals for further instructions on calibration, as well as to Section 2.7.1, page 43 of the Tetra Tech START Program Level QAPP, March 2016.

Instrument calibration and frequency requirements for analytical methods are specified in SW-846 methods; the instrument and equipment manufacturer's operating manuals associated with the analytical methods; the laboratory QAM; and in Section 2.7.2, page 44 of the Tetra Tech START Program Level QAPP, March 2016.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables

Supplies and consumables (sample containers, sampling implements, sample packaging materials, and PPE identified in the HASP, including disposable nitrile gloves and boot covers) required for this sampling event will be inspected and accepted by the Tetra Tech site manager or designated field team member. All sample containers will be pre-cleaned certified and meet the required detection limits established by EPA in the Office of Solid Waste and Emergency Response Directive 9240.0.05A *Specifications and Guidance for Contaminant-Free Sample Containers*. Sampling implements will be either disposable, one-time use devices or sealed, decontaminated equipment with a chain-of-custody seal. Equipment rinsate blanks will be collected to assess any impacts of disposable and reusable sampling equipment on sampling results. Sampling equipment and packaging materials will meet requirements of the EPA Region 4, SESD FBQSTP for *Packing, Marking, Labeling and Shipping of Environmental and Waste Samples*, (SESDPROC-209-R3), February 2015. See Section 2.8, page 45 of the Tetra Tech START Program Level QAPP, March 2016. See Table B-5 in Appendix B for a list of supplies and consumables to be used during this sampling event.

2.9 Non-Direct Measurement Requirements

Information pertaining to the site (including any reports, correspondence, photographs, maps, and so forth) has been compiled from file information obtained from EPA and NCDEQ. The extent to which these data and information, if any, are used to achieve the objectives of this project will be determined by Tetra Tech in cooperation with the EPA TM. Any justifications and qualifications required for use of these data and information will be provided in the reports generated for this project. Refer to Section 2.9, page 45 of the Tetra Tech START Program Level QAPP, March 2016.

2.10 Data Management

All reference materials generated during this investigation and included in the final reports will be submitted to the EPA TM in portable document format (PDF) on compact disc. In addition, a Scribe database will be created for the site to store analytical results and field data, including sample coordinates, sample depths, and soil screening and lithology. Information in the Scribe database will be exported via appropriate electronic data delivery (EDD) files and checked for QC by use of the EQuIS data processor (EDP) for uploading into EQuIS, and will be submitted to EPA with the transmittal. All field-generated data, including GPS data, electronic field forms, field sheets, chains-of-custody, and logbooks; laboratory-generated data; and other records (electronic and hardcopy), including project deliverables generated or obtained during this project will be managed and retained according to the requirements of EPA START IV Contract No. EP-S4-14-03, as well as according to Section 2.10, page 46 of the Tetra Tech START Program Level QAPP, March 2016; and Section 5.0, pages 16 through 18 of the Tetra Tech START QMP, November 2015.

3.0 ASSESSMENT AND OVERSIGHT

3.1 Assessment and Response Actions

Field and laboratory audits will not occur during this project. All deliverables to which Tetra Tech contributes in whole or in part, including the draft and final reports, will be subject to a corporate three-tiered review process, which includes a technical review, an editorial review, and a QC review. Each reviewer will sign off on a QC review sheet, recording any issues or revisions and how these will have been addressed. These reviews will be performed by qualified individuals in accordance with the requirements of EPA START IV Contract No. EP-S4-14-03 and with Section 9.2, page 28 of the Tetra Tech START QMP, November 2015; also see Section 3.1, page 47 of the Tetra Tech START Program Level QAPP, March 2016.

3.2 Corrective Action

The Tetra Tech site manager, in coordination with the EPA TM, is responsible for (1) identifying failures in sampling and in field measurement systems, (2) overseeing any corrective actions, (3) ensuring that corrective actions are documented in site logbooks and other appropriate records, and (4) assessing effectiveness of corrective actions. Corrective actions that deviate from the approved SAP/QAPP will be discussed in the draft and final reports. The data validation report will discuss corrective actions that affect laboratory data packages. Corrective action requirements for sample collection, field measurements (GPS and air monitoring data collection), and laboratory analyses appear in Section 3.1.2, page 49 of the Tetra Tech START Program Level QAPP, March 2016.

3.3 Reports to Management

Tetra Tech is responsible for notifying the EPA TM if any circumstances arise during the field investigation that may impair the quality of data acquired. All formal deliverables to EPA associated with this project will be prepared, reviewed, and distributed in accordance with requirements of the EPA START IV Contract No. EP-S4-14-03; Section 3.2, page 51 of the Tetra Tech START Program Level QAPP, March 2016; and under supervision of the Tetra Tech START contract QA manager, Jessica Vickers or her appropriate designee.

4.0 DATA VALIDATION AND USABILITY

4.1 Data Review, Verification, and Validation Requirements

All field-generated data and records (such as field sampling sheets, GPS coordinates of samples and other locations, field monitoring data, and field logbook notes) will be reviewed for completeness and accuracy by the Tetra Tech site manager and appropriate designees. Field records will be reviewed at the end of each day so that corrective actions, as necessary, can occur before field crews demobilize from the site.

GPS data generated in the field will be downloaded and reviewed by the Tetra Tech site manager to ensure accuracy of these data. Any errors will be discussed with a Tetra Tech geographic information system (GIS) analyst, corrected, and noted in the logbook.

Initial acceptance of laboratory analytical results (except results for asbestos analysis) from the samples collected will be determined via data validation by Tetra Tech, and will allow an evaluation of usability of the data. A Stage 2A validation of the data packages will be performed in accordance with the EPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review, January 2017 (accessible at https://www.epa.gov/clp/superfund-clp-national-functional-guidelines-data-review); the NFGs for Inorganic Superfund Methods Data Review, January 2017 (accessible at https://www.epa.gov/clp/superfund-clp-national-functional-guidelines-data-review); and Section 4.2.2, page 53 of the Tetra Tech START Program Level QAPP, March 2016. Any qualified or rejected data and the reasons for qualification/rejection will be summarized in the data validation report.

4.2 Verification and Validation Methods

All field-generated data will be maintained in the project file and included (as appropriate) in project deliverables in final form after all reviews and associated corrective actions. Laboratory analytical data will be validated as described in Section 4.1 above. Data validation reports will include a summary of all data qualifier flags and explanations of these. Laboratory data also will be included (as appropriate) in project deliverables in final, validated form (including all data validation qualifiers) after completion of data validation and associated reviews. Also see Section 4.2, page 53 of the Tetra Tech START Program Level QAPP, March 2016.

4.3 Reconciliation of the Data to Project-Specific DQOs

The Tetra Tech site manager, in cooperation with the EPA TM and Tetra Tech START QA manager, will be responsible for reconciling the data and other project results with requirements specified in this SAP/QAPP and by data users and decision makers. Ultimate acceptance of the data is at the discretion of the EPA TM. Depending on how specific data quality indicators do not meet project requirements, the data may be discarded, and resampling and reanalysis of the subject samples may be required. Resampling, reanalysis, or other out-of-scope actions identified to address data quality deficiencies and data gaps will require approval by the EPA TM, EPA Project Officer, and EPA Contracting Officer.

Limitations of the data and data qualification (including rejection) will be identified during the validation process conducted by Tetra Tech. To assess the data relative to objectives of the project, the data will be reviewed to determine whether any data are rejected and whether any data qualifiers or limitations assigned during the validation process affect usability of the data, as defined in Section 1.5 of this QAPP. Tetra Tech will review all final laboratory data packages to evaluate whether the site-specific DQOs, as defined in Section 1.5 of this SAP/QAPP, are met. The data will be reconciled with project-specific DQOs also in accordance with EPA guidance documents, including "Guidance on Systematic Planning Using the Data Quality Objectives Process," EPA QA/G-4, February 2006. Also see Section 4.3, page 55 of the Tetra Tech START Program Level QAPP, March 2016.

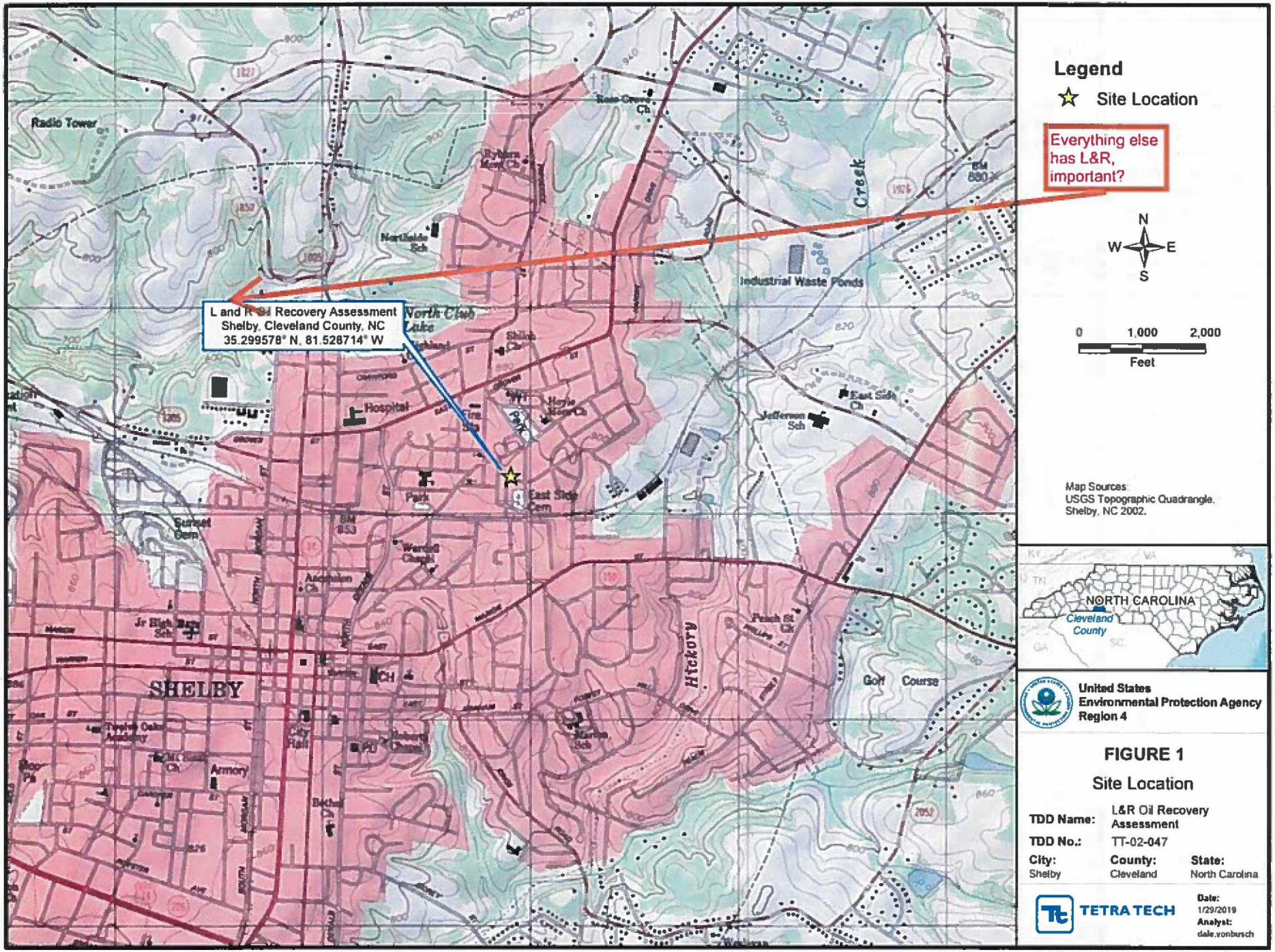
APPENDIX A

FIGURES

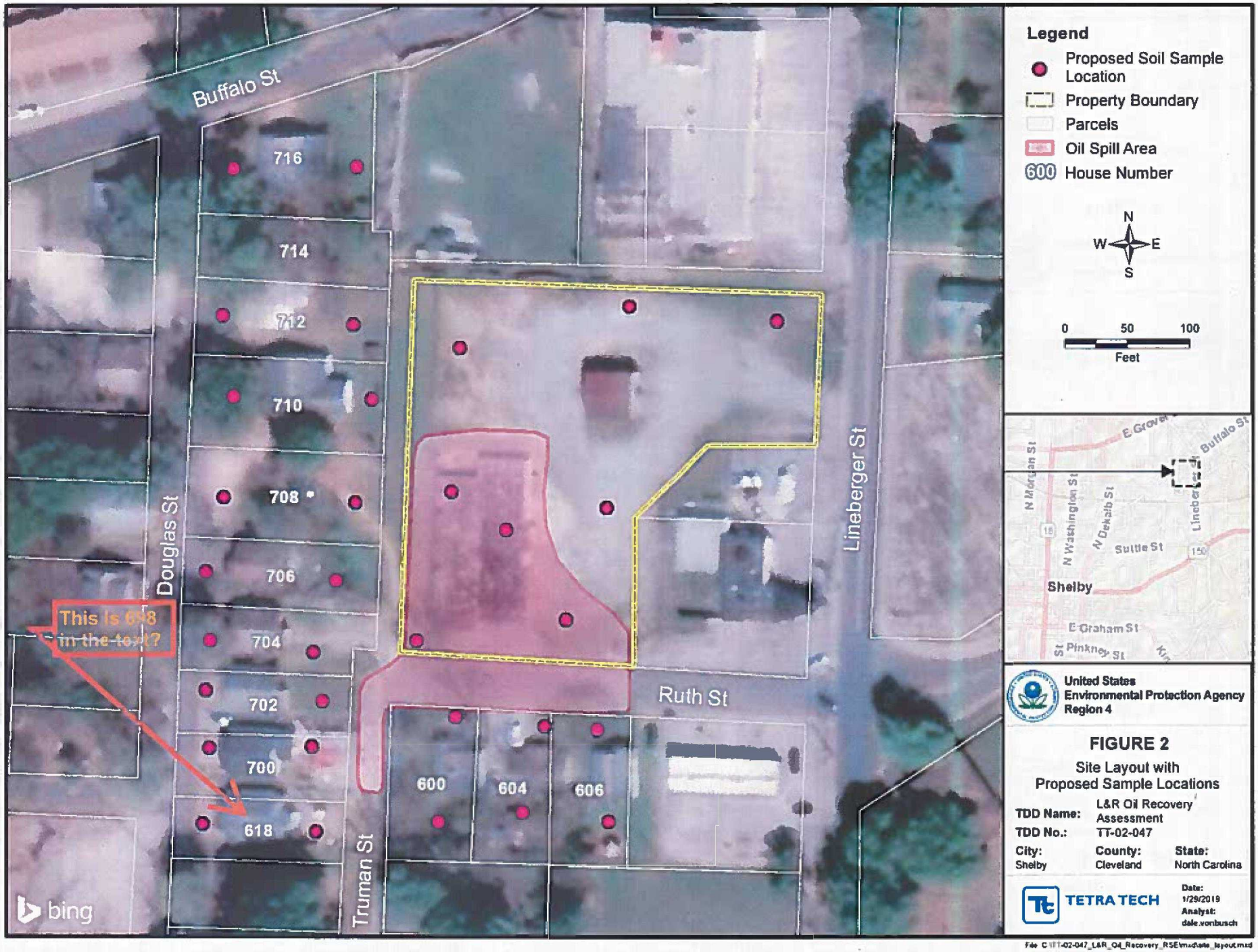
(Two Pages)

Figure

1 SITE LOCATION
2 SITE LAYOUT



File: C:\TT-02-047_L&R_Oil_Recovery_RSE\mxd\site_location.mxd



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APPENDIX B

TABLES

(Six Pages)

Table

B-1 ENVIRONMENTAL SAMPLING LOCATIONS, DEPTH, TYPE, ANALYSES, CONTAINERS, AND RATIONALE

B-2 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

B-3 ANALYTICAL PARAMETERS AND METHODS, REQUIRED SAMPLE CONTAINERS, PRESERVATION METHODS, AND HOLDING TIMES

B-4 PERFORMANCE OR ACCEPTANCE CRITERIA

B-5 EQUIPMENT AND SUPPLIES

TABLE B-1
L&R OIL RECOVERY ASSESSMENT
ENVIRONMENTAL SAMPLING LOCATIONS, DEPTH, TYPE, ANALYSES, CONTAINERS, AND RATIONALE

Station ID	Sample ID	Depth (inches)	Sample Type	Analysis	Container	Location	Rationale
Soil Samples							
LROAS##	LROA-SS-NN-mmddyy	0 to 12	Soil	VOC	Three 40-mL glass vials (two with sodium bisulfate and one with methanol) and Teflon-lined septum lids	Surface soil sample collected on site from a functional space as determined in the field by the EPA TM.	Determine the presence or absence of contamination.
					One 2-oz glass jar		
				PAH	One 4-oz glass jar		
				PCB			
				RCRA Metals	One 4-oz glass jar		
LROAR##	LROA-XXXYY-A-mmddyy LROA-XXXYY-B-mmddyy	0 to 12	Soil	PCB	One 4-oz glass jar	Surface soil sample collected from the front yard and the backyard of a residential property.	Determine the presence or absence of contamination.
Suspect ACM Samples							
LROAACM	LRO-ASB-HA-NN	NA	Bulk Material	PLM	Resealable plastic bag	Various locations throughout the buildings on site.	Determine the presence or absence of ACM in the buildings.
LROAACM	LRO-ASB-HA-NN	NA	Bulk Material	TEM	Resealable plastic bag	Various locations throughout the buildings on site.	Determine the presence or absence of ACM in the buildings.
Station ID	**Sample ID**	**Pump Flow Rate (L/min)**	**Sample Duration (minutes)**	**Analysis**	**Sampling Equipment[a]**	**Sampling Location**	**Rationale**
Background Perimeter Area Air Samples (PCM)							
LROBGL01 through LROBGLXX	LROA-BG-LXX-mmddyy	8.5	480	PCM	Gillian Aircon 2 and 25-mm diameter, 0.8-µm MCE cassette	Initial background area air samples will be collected around the perimeter of the site prior to removal activities.	Determine the effectiveness of engineering controls to prevent airborne fibers from migrating from the site.
Daily Perimeter Area Air Samples (PCM)							
LROAAL01 through LROAALXX	LROA-AA-LXX-mmddyy	8.5	480	PCM	Gillian Aircon 2 and 25-mm diameter, 0.8-µm MCE cassette	Daily area air samples will be collected around the perimeter of the site during removal activities.	Determine the effectiveness of engineering controls to prevent airborne fibers from migrating from the site.

Notes:

[a]: Specific make and model of air pumps is listed in this column; other makes and models may be used as long as they are capable of providing air flow at the designated flow rates, with the same precision as the listed pumps, and over the planned sampling durations.

##: Station identification number
A: Sample collected from front yard of residential property
AA: Area air sample
ACM: Asbestos-containing materials
ASB: Asbestos bulk material sample
B: Sample collected from backyard of residential property
BG: Background air sample
EPA: U.S. Environmental Protection Agency
HA: Homogeneous area
ID: Identification
L/min: Liters per minute
LRO: L&R Oil Recovery Assessment
LROA: L&R Oil Recovery Assessment
LROAR: L&R Oil Recovery Assessment - Residential property
LROAS: L&R Oil Recovery Assessment - On site
LXX: Air sampling location to be assigned during field activities
µm: Micrometer
MCE: Mixed cellulose ester
mL: Milliliter
mm: Millimeter
mmddyy: Date sample was collected
NN: Sample number to be determined in the field
NA: Not applicable
oz: Ounce
PAH: Polynuclear aromatic hydrocarbons
PCB: Polychlorinated biphenyls
PCM: Phase contrast microscopy
PLM: Polarized light microscopy
RCRA: Resource Conservation and Recovery Act
SS: Site soil sample
TEM: Transmission electron microscopy
TM: Task monitor
VOC: Volatile organic compound
XXXYY: Residential address where sample was collected

TABLE B-2
L&R OIL RECOVERY ASSESSMENT
QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Station ID	Sample ID	Sample Type	Analysis	Container	Rationale
LROAEB	LROA-EB-##-mmddyy	Equipment rinsate blank (aqueous)	VOC	Two 40-mL glass vials with hydrochloric acid and Teflon-lined septum lids	Evaluate whether decontamination procedures adequately clean sampling equipment. One equipment rinsate blank will be submitted for the sampling equipment.
			PAH	Two unpreserved 40-mL amber glass vial	
			PCB	Two 1-liter amber glass bottles	
			RCRA Metals	One 250-ml plastic bottle with nitric acid	
LROAFB	LROA-FB-##-mmddyy	Field blank (aqueous)	VOC	Two 40-mL glass vials with hydrochloric acid and Teflon-lined septum lids	Evaluate the potential for contamination of a sample from sources not associated with sample collection (ambient conditions). One field blank will be submitted for each lot of high purity decontamination water used.
			PAH	Two unpreserved 40-mL amber glass vial	
			PCB	Two 1-liter amber glass bottles	
			RCRA Metals	One 250-ml plastic bottle with nitric acid	
LROAS## or LROAR##	(Original Sample ID)	Soil field MS/MSD - On site and residential	VOC	Three 40-mL glass vials (two with sodium bisulfate and one with methanol) and Teflon-lined septum lids	Provide information about the effect of each sample matrix on the sample preparation procedures and measurement methodology. One MS/MSD sample will be designated for every 20 samples collected per matrix.
				One 2-oz glass jar	
			PAH	One 4-oz glass jar	
			PCB		
			RCRA Metals	One 4-oz glass jar	
LROAS## or LROAR##	(Original Sample ID)-DUP	Soil field duplicate sample - On site and residential	VOC	Three 40-mL glass vials (two with sodium bisulfate and one with methanol) and Teflon-lined septum lids	Measure both field and laboratory precision. One duplicate sample will be collected for every 20 samples collected per matrix.
				One 2-oz glass jar	
			PAH	One 4-oz glass jar	
			PCB		
			RCRA Metals	One 4-oz glass jar	
LROATB	LROA-TB-##-mmddyy	Trip blank (aqueous)	VOC	Two 40-mL glass vials with hydrochloric acid	Evaluate if unknown site conditions or sample handling procedures are influencing analytical results. One trip blank will be submitted with each sample shipment for volatile organic compound analysis only.

TABLE B-2
L&R OIL RECOVERY ASSESSMENT
QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Station ID	Sample ID	Sample Type	Analysis	Container	Rationale
LROALOT	LROA-LB-mmddyy	Lot blank (air)	PCM	Lot blank for 0.8 µm MCE membrane filter cassettes	Determine whether the sample collection media are affecting the analytical results for air samples. Two lot blanks will be collected per lot of cassettes.
LROAFB	LROA-FB##-mmddyy	Field blank (air)	PCM	Field blank for 0.8 µm MCE membrane filter cassettes	Determine whether the air sample collection media are being contaminated through field handling (but not including collecting air samples) and shipping of the media; thus, affecting the analytical results for air samples. Each set of samples taken will include 10 percent field blanks or a minimum of 2 field blanks. These blanks must come from the same lot as the filters used for sample collection.

Notes: Notes: Also refer to Section 2.5 of this QAPP.

##: Sample number to be determined in the field
BTEX: Benzene, toluene, ethylbenzene, xylene
DUP: Duplicate sample
EB: Equipment rinsate blank
FB: Field blank
ID: Identification
LB: Lot blank
LOT: Lot blank
LROA: L&R Oil Recovery Assessment
LROAR: L&R Oil Recovery Assessment - Residential property
LROAS: L&R Oil Recovery Assessment - On site
µm: Micrometer
mL: Milliliter
mmddyy: Date sample was collected
MS/MSD: Matrix spike/matrix spike duplicate
oz: Ounce
PAH: Polynuclear aromatic hydrocarbons
PCB: Polychlorinated biphenyl compounds
PCM: Phase Contrast Microscopy
RCRA: Resource Conservation and Recovery Act
TB: Trip blank
VOC: Volatile organic compound

TABLE B-3
L&R OIL RECOVERY ASSESSMENT
ANALYTICAL PARAMETERS AND METHODS, REQUIRED SAMPLE CONTAINERS, PRESERVATION METHODS, AND HOLDING TIMES

Analytical Parameter	Parameter to be Noted on Chain-of-Custody Records	Matrix	Analytical Method[1]	Number[2] and Type of Sample Container	Preservation Method	Sample Holding Time
Soil Samples						
VOC[3]	VOC	Soil	SW-846 Method 8260B	One Terracore kit consisting of three 40-mL glass vials with Teflon-lined septum lids and one 2-ounce glass jar with Teflon-lined lid	Hydrochloric acid (one of the vials); methanol (one of the vials); sodium bisulfate (one of the vials); cool to 4 °C	48 hours to preparation; 14 days for analysis
PAH[3]	PAH		SW-846 Method 8270D	One 4-oz glass jar	Cool to 4 °C	14 days to extraction; extracts must be analyzed within 40 days following extraction.
PCBs[3]	PCB		SW-846 Method 8082A			14 days to extraction; extracts must be analyzed within 40 days following extraction.
RCRA Metals[3]	RCRA Metals		SW-846 Method 6010D/6020B	One 4-oz glass jar		14 days to extraction; extracts must be analyzed within 40 days following extraction.
Suspected ACM Samples						
Asbestos by PLM	PLM	Bulk Material	EPA 600-R-93-1164	Resealable plastic bag	None	Indefinite
Asbestos by TEM	TEM	Bulk Material	EPA 600-R-93-116[4]	Resealable plastic bag	None	Indefinite
Air Samples						
Asbestos by PCM	PCM	Air	NIOSH Method 7400[5]	One 25–mm diameter, 0.8-µm MCE membrane filter cassette	None	Indefinite
Asbestos by TEM	TEM	Air	NIOSH Method 7402[6]	One 25–mm diameter, 0.8-µm MCE membrane filter cassette	None	Indefinite

TABLE B-3
L&R OIL RECOVERY ASSESSMENT
ANALYTICAL PARAMETERS AND METHODS, REQUIRED SAMPLE CONTAINERS, PRESERVATION METHODS, AND HOLDING TIMES

Notes:

1 U.S. Environmental Protection Agency, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846), available at the following web address: https://www.epa.gov/hw-sw846.

2 For samples designated for MS/MSD analysis, sample volume as indicated in Table B-2 are required.

3 Available at the following web address: https://www.epa.gov/clp/superfund-clp-analytical-statements-work-sows.

4 Environmental Protection Agency (EPA), Method for the Determination of Asbestos in Bulk Building Materials, Method EPA/600/R-93/116, available at the following web address: http://www.nist.gov/nvlap/upload/EPA-600-R-93-116.pdf.

5 National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods, Asbestos and Other Fibers by Phase Contrast Microscopy, Method 7400, available at the following web address: http://www.cdc.gov/niosh/docs/2003-154/pdfs/7400.pdf.

6 NIOSH Manual of Analytical Methods, Asbestos by Transmission Electron Microscopy, Method 7402, available at the following web address: http://www.cdc.gov/niosh/docs/2003-154/pdfs/7402.pdf

°C: Degrees Celsius
EPA: U.S. Environmental Protection Agency
MCE: Mixed cellulose ester membrane filter contained in a cassette
µm: Micrometer
mL: Milliliter
mm: Millimeter
NIOSH: National Institute of Occupational Safety and Health
oz: Ounce
PAH: Polynuclear aromatic hydrocarbons
PCB: Polychlorinated biphenyl compounds
PCM: Phase contrast microscopy
PLM: Polarized light microscopy
RCRA: Resource Conservation and Recovery Act
QC: Quality control
SW-846: U.S. Environmental Protection Agency, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846)
Physical/Chemical Methods (SW-846)
VOC: Volatile organic compounds

TABLE B-4
L&R OIL RECOVERY ASSESSMENT
PERFORMANCE OR ACCEPTANCE CRITERIA

Soil and Field Quality Control Samples	
Analytical Parameter	**Analytical Method**
VOC	SW-846 Method 8260D
PAH	SW-846 Method 8270D
PCB	SW-846 Method 8082A
RCRA Metals	SW-846 Method 6010D/6020B
Asbestos (Bulk Material)	EPA/600/R-93/116
Asbestos (PCM)	NIOSH Method 7400
Asbestos (TEM)	NIOSH Method 7402
Data Quality Measurements	
Accuracy	Refer to the EPA Region 4, SESD FBQSTP for *Soil Sampling* (SESDPROC-300-R3), August 2014; *Field Equipment Cleaning and Decontamination* (SESDPROC-205-R3), December 2015; and EPA Region 4, *Bulk Sampling for Asbestos* (SESDGUID-104-R1), June 2013; *Ambient Air Sampling* (SESDPROC-303-R5), March 2016; *Global Positioning System* (SESDPROC-110-R4), June 2015; *Method for the Determination of Asbestos in Bulk Building Materials*, EPA 600-R-93-116, July 1993; and, the data validation guidance documents discussed in Sections 4.1 and 4.2 of this QAPP.
Precision	Refer to the EPA Region 4, SESD FBQSTP for *Soil Sampling* (SESDPROC-300-R3), August 2014; *Field Equipment Cleaning and Decontamination* (SESDPROC-205-R3), December 2015; and EPA Region 4, *Bulk Sampling for Asbestos* (SESDGUID-104-R1), June 2013; *Ambient Air Sampling* (SESDPROC-303-R5), March 2016; *Global Positioning System* (SESDPROC-110-R4), June 2015; *Method for the Determination of Asbestos in Bulk Building Materials*, EPA 600-R-93-116, July 1993; and, the data validation guidance documents discussed in Sections 4.1 and 4.2 of this QAPP.
Representativeness	Sample representativeness will be achieved by following the EPA Region 4, SESD FBQSTP for *Soil Sampling* (SESDPROC-300-R3), August 2014; *Field Equipment Cleaning and Decontamination* (SESDPROC-205-R3), December 2015; *Ambient Air Sampling* (SESDPROC-303-R5), March 2016; *Global Positioning System* (SESDPROC-110-R4), June 2015; and, EPA Region 4, *Bulk Sampling for Asbestos* (SESDGUID-104-R1), June 2013.
Completeness	Based on a review of the available file information, including previous discussions with the EPA Task Monitor (TM), soil, suspect ACM, and air are proposed for collection. The EPA TM is responsible for determining if the field and laboratory data acquired during this project achieve the level of completeness required to meet the objectives of the project.
Comparability	Sample and data comparability is expected to be achieved by conducting all field and laboratory work using the same, well-documented, uniform procedures and methods.

TABLE B-5
L&R OIL RECOVERY ASSESSMENT
EQUIPMENT AND SUPPLIES

Field Instruments	Sample Containers	Sampling Equipment and Supplies	Sample Processing Supplies	Decontamination Supplies	Miscellaneous Supplies
1 tablet	Terracore kits	Stainless steel spoons	Resealable plastic bags	5-gallon buckets	Digital camera
1 GNSS attachments for tablet	2-oz glass jars	Aluminum pans	Coolers	Luminox	Permanent markers
PID/FID	4-oz glass jars	Pin flags	Custody seals	Brushes	Logbooks
Hand augers	1-L amber glass bottles	Nitrile gloves	Labels	Aluminum foil	Garbage bags
6 Gillian AirCon2 or equivalent	40-mL VOA vials with HCl	Ultra-pure water	FedEx labels	Deionized water	First aid kit
Concrete core	40-mL VOA vials with methanol	Marking paint	Duct tape	Sponges	Eyewash
	40-mL VOA vials with sodium bisulfate	Visqueen	Strapping tape	Spray bottles	2 Tables
	40-mL amber VOA vials, unpreserved		Paper towels		Chairs
	Syringe				2 Folding Tables

Notes:

FID: Flame ionization detector
GNSS: Global navigation satellite system
HCl: Hydrochloric acid
HDPE: High-density polyethylene bottle
HNO_3: Nitric acid
L: Liter
mL: Milliliter
oz: Ounce
PID: Photoionization detector
VOA: Volatile organic analysis